

# Standards of Universal Waste Management

Presented by:  
Kalie Rumaner, Hazardous Waste Inspector  
August 2024



Clean Air, Safe Water,  
Healthy Land for Everyone



## Universal Waste Regulations

Regulations applicable to Small Quantity Handlers (SQHs) and Large Quantity Handlers (LQHs) of universal waste

## Universal Waste Management

Definitions and examples of universal waste

## Management Requirements

Required universal waste management practices & documentation

## Recycling Regulations

ADEQ policies and expectations



# Universal Waste Overview

# Definitions: 40 CFR § 260.10 & 273.9

## Generator:

- Any person, by site, whose act or process produces **hazardous waste** identified or listed in 40 CFR 261 or whose act first causes a hazardous waste to become subject to regulation

## Universal Waste (UW) Handler:

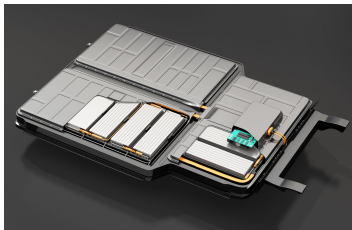
- A **generator of universal waste**; or
- The owner or operator of a facility that receives UW from other UW handlers, accumulates UW, and sends UW to another UW handler, to a destination facility, or to a foreign destination
- 40 CFR 273

## Universal Waste:

- means any of the following hazardous waste that are **managed** under the universal waste requirements of part 273: batteries, pesticides, mercury-containing equipment, lamps, & aerosol cans

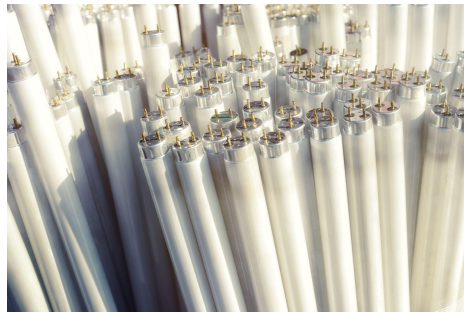
# Materials Managed under Universal Waste Regulations

## Batteries



## Lamps

Fluorescent, mercury vapor, metal halide, etc.



## Mercury Containing Equipment

Thermometers or other medical equipment, etc.



## Aerosol Cans



## Pesticides



Note: Lead-Acid batteries are typically managed under CFR 40 Part 266.80

# SQH vs LQH of Universal Waste

	<b>SQH</b>	<b>LQH</b>
<b>Quantity On-Site</b>	≤ 5,000 kg on site	> 5,000 kg on site (11,023 lbs)
<b>EPA ID Number</b>	Not required	Required
<b>Register in myDEQ</b>	Not required	Required
<b>On-site Accumulation Limit</b>	< 5,000 kg	No limit
<b>Storage Time Limit</b>	1 year	1 year
<b>Manifests</b>	Not required	Not required, but must keep basic shipping records
<b>Personnel Training</b>	Basic training	Basic training geared toward employee responsibilities

# The Universal Waste Management Standards are Designed to:

- Reduce the amount of hazardous waste items in the municipal solid waste streams
- Encourage recycling and proper disposal
- Reduce regulatory burden on facilities that generate these types of waste (in lieu of managing all of this waste as a hazardous waste 40 CFR 260-272 and not counting towards hazardous waste generation totals)



# What are Universal Waste Batteries?



01

## Waste Batteries

- Used: date when the batteries become waste.
- Unused: date handler decides to discard it

02

## Hazardous Waste Batteries

- Hazardous waste = toxic, corrosive, ignitable, reactive
- Facility elects not to manage under UW rules

03

## Universal Waste Batteries

- Facility decides to manage under UW Regs
- Batteries are not damaged

# Waste Batteries by Chemistry

## Single Use (primary) Lithium Batteries



AA/AAA, C, D, Coin/Button cell, 9v

**MUST** be fully discharged before  
recycling/disposal

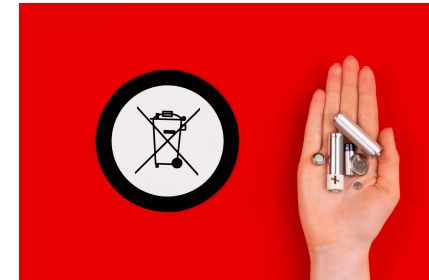
## Rechargeable (secondary) Lithium-Ion Batteries



Many forms (power tools, cell phones,  
electric vehicles, battery banks)

May be difficult to extract

## Nickel Cadmium (secondary) & Silver Oxide (primary) Batteries



Black mass is hazardous for  
cadmium

# Universal Waste Batteries Are Not:

- Spent lead-acid batteries managed under 40 CFR § 266
- Batteries that are not yet waste
- Batteries that do not exhibit a characteristic of hazardous waste (*for example, a used, single-use alkaline battery*)
- Damaged batteries



## If each battery is intact and closed handlers can:

- Mix battery types in one container – **recommend separating lithium ion batteries**
- Sorting batteries by type
- Discharge batteries to remove electric charge
- Regenerate used batteries
- Disassemble batteries/battery packs into individual batteries
- Remove batteries from consumer products
- Remove electrolytes from batteries



01

## Packing

- Tape batteries or terminals with **clear packing tape**
- Individual plastic bags
- Keep batteries **visible** for future handlers

02

## Temperature

- Keep batteries in temperature controlled areas
- Stack **large** batteries no more than two high to minimize thermal activations



03

## Sorting

- Sort batteries based on chemistry (lithium, lead-acid, nickel-cadmium)
- When sorting, minimize storage of batteries in metal or conductive containers

04

## Handling

- Minimize the possibility of dropping, crushing or puncturing batteries
- Maintain a contingency plan for **when** a thermal event happens

# Thermal Runaway of Lithium Ion Batteries

Flammable electrolyte  
+  
Electric current  
+  
Lack of heat dissipation



Thermal Runaway

When a high temperature is reached, and heat cannot be dissipated, the fire becomes self sustaining, causing thermal runaway.



# YouTube Video - Thermal Runaway





# Thermal Runaway of Lithium Ion Batteries

## Causes for lithium battery damage:

- Mechanical damage
- Lithium plating, overcharging or charge at low temperatures
- Exposure to heat, cause battery to collapse

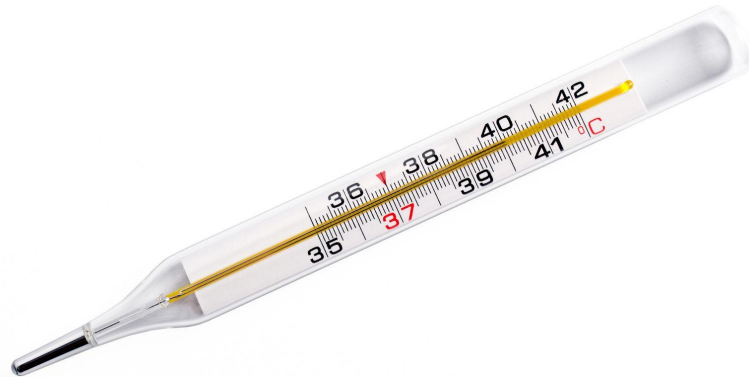




# What is Universal Waste Mercury Containing Equipment?

# Mercury Containing Equipment

- **Used** mercury-containing equipment becomes a waste on the date it is discarded
- **Unused** mercury-containing equipment becomes a waste on the date the handler decides to discard it
- Means a device or part of a device (thermostats, but excluding batteries and lamps) that contains elemental mercury integral to its function





# What are Universal Waste Lamps?

# Lamps

- Examples of common universal waste lamps include, but are not limited to:
  - fluorescent
  - high intensity discharge (HID)
  - neon
  - mercury vapor
  - high pressure sodium
  - metal halide lamps
- EPA encourages the recycling of all mercury-containing lamps, regardless of the mercury content (e.g. green tip lamps)
- Note: *if you do not test your low-mercury lamps and prove them non-hazardous, assume they are hazardous waste and manage them as universal waste!*



01

## Contractors as Cogenerators

- Facility decides to discard lamps, thus is a handler
- The contractor that actually removes the universal waste lamps from service is considered a handler **and** generator of the waste making the facility and the contractor cogenerators

02

## Cogenerators

- As cogenerators, **both** the facility and the contractor will be jointly and severally liable as universal waste handlers

# Broken Mercury Containing Lamps

The mercury contained in  
fluorescent lamps can be  
released if the lamp is  
broken



If any universal waste lamps are  
broken, a hazardous waste  
determination must be made

Broken fluorescent lamps may  
become a hazardous waste

Lamps managed in structurally sound  
& closed container should prevent  
breakage





# What are Universal Waste Pesticides?



- Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant
- When does a pesticide become a waste?
  - When a generator of a recalled pesticide participates in the recall and decides to discard
  - An unused pesticide when the generator decides to discard it



- Many pesticides are P and/or U listed and **cannot** be managed as universal waste. An accurate hazardous waste determination is required
- *Unused pesticides (not waste) remain subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)*





# What are Universal Waste Aerosol Cans?

01

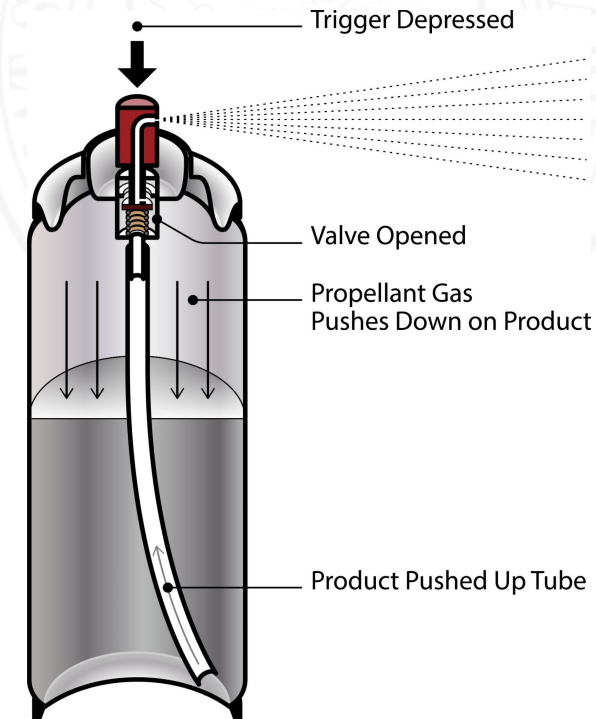
## Hazards Associated with Aerosol Cans

- Aerosol cans frequently contain flammable propellants such as propane or butane which can cause the aerosol can to demonstrate the hazardous characteristic for ignitability
- The aerosol can may also be a listed hazardous waste

02

## Universal Waste Management

- For intact, unpunctured cans, remove actuator to reduce the risk of accidental release
- Protected from sources of heat



# Aerosol Cans: Losing the UW Exemption

01

## Puncture & Draining

- Must recycle the empty can
- Loses UW exemption afterwards

02

## Requirements

- Use a device specifically designed to safely puncture aerosol cans & effectively contain the residual contents, including emissions
- Waste determination on liquid contents, likely becomes a satellite accumulation container
- Establish and follow a written procedure
- Ensure employees operating the device are trained
- A written procedure must be in place in the event of a spill or leak
- A spill clean-up kit must be provided & spills cleaned up promptly





# What are Universal Waste Management Requirements?

01

## Waste Batteries, Mercury Containing Devices, Lamps, Pesticides, Aerosol Cans

- Container structurally sound
- Container compatible with contents
- Contain leakage & prevent release to environment
- Closed (excluding aerosol cans)
- Protected from sources of heat (batteries & aerosol cans)



01

## Labeling/Marking of Containers

- Universal Waste—Battery(ies), Pesticide(s), Mercury Containing Equipment, Mercury-Thermostat(s), Lamp(s), Aerosol Can(s) or
- Waste—Batter(ies), Pesticide(s), Mercury-Containing Equipment, Mercury-Thermostat(s), Lamp(s), Aerosol Can(s) or
- Used—Battery(ies), Mercury-Containing Equipment, Mercury-Thermostat(s), Lamp(s), Aerosol Can(s)

## UNIVERSAL WASTE

SHIPPER	_____
ADDRESS	_____
CITY, STATE, ZIP	_____
CONTENTS	<u>Aerosol Cans</u>
ACCUMULATION START DATE	<u>01/01/2024</u>



01

## SQH & LQH

- May accumulate for no longer than one year from the date the universal waste is **generated** or **received**
- Must be able to demonstrate the length of time that the universal waste has been accumulated from the date it becomes a waste or is received
- Mark/label the container with the accumulation start date
- Maintaining an inventory system on-site
- Placing the universal waste in a specific accumulation area and identifying the earliest date that any universal waste in the area became a waste or was received



# Required Documentation

01

**SQH & LQH**

- Employee training
- SQH – § 273.16 and LQH - § 273.36

02

**LQH**

- Basic shipping papers of each shipment of universal waste received and shipped off-site
- Must maintain records for 3 years
- § 273.39





# What are Off-Site Shipments?

## Transport

§ 273.50 - § 273.56

01

### Off-Site Shipments

- Must send to another universal waste handler, a destination facility, or a foreign destination
- Prior to sending a shipment of universal waste, the originating handler must ensure that the receiving handler agrees to receive the shipment
- If a universal waste sent off-site transportation meets the definition of hazardous materials (49 CFR parts 171-180), the handler must be in accordance with the applicable DOT regulations
- Exporting to foreign destination? § 262 subpart H

02

### Transportation

- If self-transporting, the handler becomes a universal waste transporter and must comply with the transporter requirements of 273 **subpart D**



# What are Universal Waste Destination Facilities?

## Standards

§ 273.60 - § 273.62

- If your facility accepts universal waste and are recycling them, you are likely classified as a universal waste destination facility, and may also be classified as a recycler | [see 40 CFR § 273.9](#)
- If your facility is recycling a particular universal waste (**e.g. batteries**) in compliance with the recycling exemptions, you must be able to prove the recycling activities are legitimate and comply with ADEQ's substantive policy regarding storage prior to recycling | [See 40 CFR § 261.6\(c\)\(2\)](#) | [View Substantive Policy](#)
- The owner/operator of a destination facility must keep a record of each shipment of universal waste received at the facility for **3 years** from the date of receipt of a shipment

# Presentation Takeaways

01

## Universal Waste Identification

- Universal waste is an exclusion of hazardous waste
- Damaged batteries/lamps need a waste determination

02

## Best Management Practices

- Recommend separating lithium batteries & tape terminals
- Remove aerosol can actuators & protect from heat source
- Properly close structurally sound containers

03

## Required Documentation

- SQH & LQH employee training
- LQH: shipping papers, save for 3 years

04

## Off-Site Shipments

- Transporting requires compliance with § 273 subpart D

05

## Arizona Recycling Policies

- Storage before or during recycling requires a permit
- Certain recycling activities are exempt from permitting, check with ADEQ

# Questions and Further Resources



- **Free Universal Waste Lamps & Ballasts Training**

- <http://www.almr.org/1hourtrainingmodule.pdf>

- **ADEQ Universal Waste & Aerosol Can Fact Sheets**

- <https://www.azdeq.gov/node/9724>

- **Industry Waste Battery Fact Sheet**

- [https://www.azdeq.gov/battery\\_mgmt](https://www.azdeq.gov/battery_mgmt)

- **EPA FAQs on Universal Waste**

- <https://www.epa.gov/hw/frequent-questions-about-universal-waste>

- **myDEQ Access**

- <https://azdeq.gov/mydeq>

- **FIFRA**

- <https://www.epa.gov/enforcement/federal-insecticide-fungicide-and-rodenticide-act-fifra-and-federal-facilities>



# Thank You!

For General Hazardous Waste  
Questions:

[hazardouswasteicu@azdeq.gov](mailto:hazardouswasteicu@azdeq.gov)



---

Clean Air, Safe Water,  
Healthy Land for Everyone

---